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Demonstration Model of Spherical Projection for Cubic Crystals

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IN the course of its work, an x-ray diffraction laboratory finds much use for various crystallographic models not only to aid in interpreting x-ray data but also to aid in presenting the results to research and development people. One such model that has found extensive use in our laboratory for several years is the model of the spherical projection of a cubic crystal shown in Fig. 1. The 8-in. sphere was machined from a laminated block of Lucite. The major zones of a cubic crystal were then inscribed on the surface and all the poles usually associated with standard projections were marked with the respective Miller indices. The same pattern of spots would be obtained if a single crystal were irradiated while at the center of a spherical film.[1] Filling the zones and poles with suitable colored pigments resulted in a legible and quite durable model. Since the sphere is relatively heavy, its base consists simply of a concave, felt-lined, hardwood ring on which the sphere can be rotated easily in any direction. The vernier protractor is used to measure the angular distance between any two-pole positions on the sphere.

The model has found extensive use in demonstrating clearly the relation of crystallographic planes to one another while allowing accurate measurement of interplanar angles. Also, it has practical utility in the initial interpretation of fixed single-crystal diffraction patterns. The proved demonstrative capabilities of this model suggest that it could be used effectively in crystallography courses.

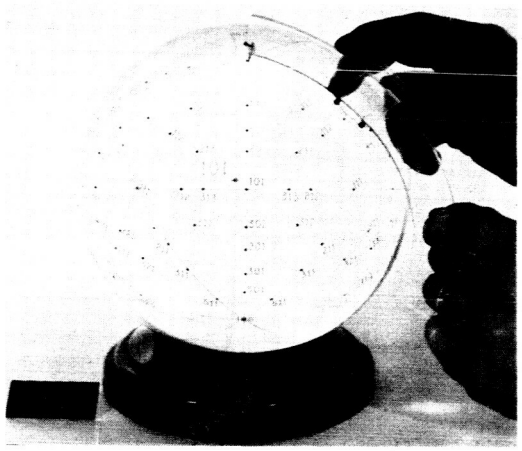

FIG. 1. Spherical projection of a cubic lattice.

[1] A. Herzog and D. McLachlan, Jr., Am. J. Phys. **22**, 33 (1954).

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